

Asset financing in uncertain times: the case of airlines and aircraft leasing

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Abstract

Aviation is crucial for global economic recovery from the impact and effects of COVID-19. Aircraft leasing, as a main form of asset management for airlines, plays a key role to lower operating risks and increase fleet flexibility. This article aims to perform a detailed analysis of the aircraft leasing business model, the main forms of leasing contracts, the relating stakeholders involved, as well as the respective value flows among them, to discuss how these types of contracts can benefit airlines and their fleet management in the face of market uncertainty.

Keywords: Aircraft leasing; Airlines' ecosystem; Uncertainty, Assets' management; Assets' financing.

Résumé

L'aviation est cruciale pour la reprise économique mondiale après l'impact et les effets de la COVID-19. Or ce secteur a été confronté à plusieurs crises entraînant un fort degré d'incertitude, ce qui l'a conduit à innover dans le financement de ses actifs. Le leasing d'avions, en tant que principale forme de financement d'actifs pour les compagnies aériennes, joue un rôle clé pour réduire les risques opérationnels et augmenter la flexibilité de la flotte. Cet article vise à effectuer une analyse détaillée du modèle économique du leasing d'avions, des principales formes de contrats de leasing, des parties prenantes concernées, ainsi que des flux de valeur respectifs entre elles, afin de discuter de la manière dont ces types de contrats peuvent bénéficier aux compagnies aériennes et à la gestion de leur flotte face à l'incertitude du marché.

Mots-clés : Leasing d'avions ; Ecosystème des compagnies aériennes ; Incertitude, Gestion des actifs ; Financement des actifs.

1. Introduction

In the early 1980s, it was common for airlines to own most of their aircraft fleet. However today, over 40 years later, the incredible financial burden of purchasing brand new aircraft is so significant that virtually all airlines decide to lease at least part of their fleet (Ciesluk, 2020). In fact, this phenomenon has been consolidating itself over the last decades and is proving to be resilient in the face of uncertainties such as: after the 911 attacks in 2001, the financial crisis in 2008, and the on-going COVID-19 pandemic.

Forty years ago, the aircraft-leasing industry was virtually nonexistent, and accounted for less than 2% of the global aircraft fleets. This percentage remained small until the early 1990s, which was around 15%, then it jumped to 25% in 2000, and finally over 40% in 2017 (Kaplan, 2017). By 2023, a total of \$181 billion in funding (already adjusted by the pandemic impacts) are expected to meet the demand for new aircraft (Mazareanu, 2021).

In this regard, leasing is born out of the need to operate an aircraft without the financial burden of having to buy one. As stated by Guzhva, Raghavan, and d'Agostino (2019), the costs associated with leasing, although high, come with lower risks and increased fleet flexibility for the airlines when compared to purchasing. Thereby, **in contexts of economic uncertainties, can aircraft leasing can be an interesting business model for airlines?**

This discussion article aims discuss how airlines use different types of aircraft leasing models to enhance their flexibility, face market uncertainty and embed in a novel business ecosystem in which new key stakeholders generate new value flows. We discuss how such leasing business model can benefit airlines, and the management of their flying assets in periods of uncertainty.

2. Research methods

This study is characterized as a qualitative and descriptive research (Yin 2011; Gil, 2008) with data collected based both on secondary sources and in-depth interviews. Figure 1, details the adopted research design.

For the secondary sources, documents were collected on Scopus and Google Scholar, as well as on consulting reports, official governmental documents, legal documents, companies' webpages, and news outlets. The searched terms included a combination of "Leasing contracts", "Aircraft lease", "Leasing market", "Aircraft Finance" among others. Secondary data analysis followed the deductive analysis method. Primary data was collected by two in-depth interviews with professionals in the aviation industry (1 aircraft manufacturer and 1 aircraft leasing company). In here the inductive method was employed, as it was sought,

based on the answers, to find coincidences among the analyzed elements and establish generalizations about the aircraft leasing business model and uncertain economic times.

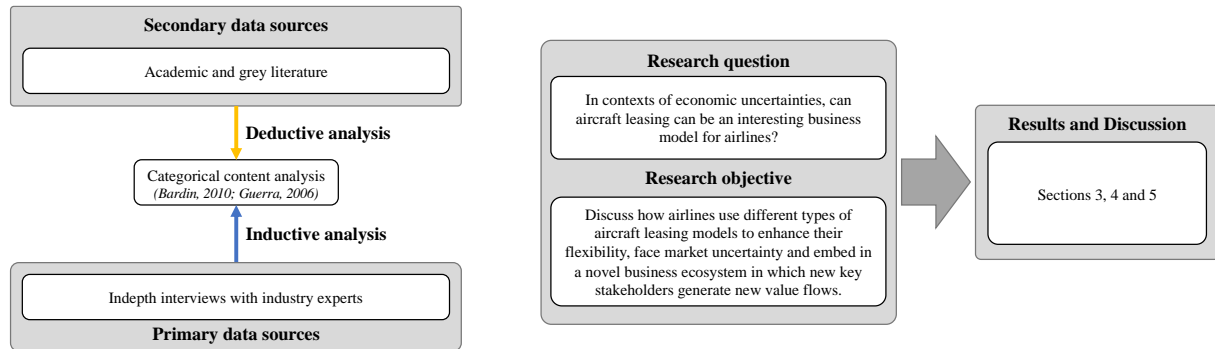


Figure 1. Research design

Source: Prepared by the authors based on Leipold and Petit-Boix (2018).

For both primary and secondary data collection, we have applied both the snowball technique to collect additional data (Atkinson & Flint, 2001) and the saturation criteria (Fontanella, Ricas & Turato, 2008) as a stopping point. A categorical content analysis of the searched materials was performed to achieve the proposed research objectives. The data was analyzed manually based on the deductive categories presented in and the results and discussion are shown in the following sections.

3. The impact of aircraft leasing on commercial aviation

With a growing world population and historically low oil prices in recent years, the demand for air travel has been increasing exponentially. The number of airline passengers increased eightfold from 1980 to 2017, and almost doubled from 2007 to 2017 exceeding 4 billion passengers per year (Guzhva, Raghavan & d’Agostino, 2019). Recent industry indexes show significant air traffic growth and aircraft sales for the next 20 years. Airbus forecasts average growth in air traffic of 3.9% per year (Airbus, 2021), while Boeing expects annual air traffic growth of 4.0% with which approximately 43,610 new deliveries (from all OEMs) at an estimated market value of US\$6.1 trillion by 2036 (Boeing, 2021), both reports already considering the COVID-19 crisis impact on the industry.

By 2023, with \$181 billion needed in funding to meet the demand for new aircraft, leasing is born out of the need to operate an aircraft without the financial burden of having to buy one (Mazareanu, 2021). As stated by Guzhva, Raghavan, and d’Agostino (2019), Jill (2016), and as presented on Table 1, as of December 2017, there were more than 20 aircraft leasing companies (also known as: lessors) with aircraft portfolio values \$1 billion or more – most of them based either in Ireland, Hong Kong or Singapore. Even more impressive, the top three

lessors manage almost 3000 aircraft with a combined fleet value of \$76.7 billion.

Table 1. Top 20 aircraft lessors based on fleet value

2017 Rank	Lessor	Total Fleet Value (\$ million)	Total Number of Aircraft
1	AerCap	31,944	1076
2	GECAS	25,760	1324
3	Avolon	19,038	585
4	SMBC Aviation Capital	15,808	450
5	BBAM LLC	15,523	324
6	ICBC Leasing	13,931	323
7	BOC Aviation	13,890	326
8	Air Lease Corporation	12,896	293
9	DAE Capital	10,536	349
10	Aviation Capital Group	7340	273
11	CDB Aviation Lease Finance	6915	198
12	BoCom Leasing	6671	165
13	Jackson Square Aviation	6305	152
14	ORIX Aviation	6219	227
15	Nordic Aviation Capital	5865	416
16	Macquarie AirFinance	4955	204
17	Stardard Chartered Aviation Finance	4913	136
18	Aircastle Limited	4659	191
19	Goshawk	3668	93
20	China Aircraft-Leasing Limited	3593	103

Source: adapted from Guzhva, Raghavan, and d'Agostino (2019), p.9.

Over the past recent years, the aircraft-leasing industry has been going through consolidation with mergers and acquisitions. For instance, AerCap, the market leader, acquired International Lease Finance Corporation in December 2013, and recently finished its merging processes with GECAS – General Electric Capital Aviation Services (market's 2nd place on Table 1) in March 2021, thereby creating the biggest aircraft leasing company ever in existence, with a portfolio of over 2,000 aircraft, over 900 engines, over 300 helicopters, and approximately 450 new aircrafts in backlog (Guillot, 2021).

As Guillot (2021) states, this merger between the two world's largest leasing companies is the sign of a general trend that has been confirmed with the outbreak of the COVID-19 pandemic: airlines are increasingly using leasing to acquire aircraft in their fleet. Thus, the industry consolidation will likely continue as larger lessors are better positioned to take advantage of their low cost of capital and the attractive deals available in the strong market (O'Mara, O'Brien, & Woods, 2020).

In the long run, leasing an aircraft is more expensive than purchasing it. On the other hand, the costs associated with leasing also come with reduced risks and increased fleet flexibility for the airlines, especially in contexts of market uncertainty (Guzhva, Raghavan, & D'Agostino, 2019). A study by Bourjade, Huc, and Muller-Vibes (2017), found that the

optimal level of leasing for the airline industry is 53.4%. However, the industry in general, as shown by Kaplan (2017), is operating at a leasing rate of around 40%, which is below the estimated optimum. The constant growth of the leasing industry in recent years is an indication that airlines are trying to achieve this optimal level of leasing in their fleets.

The effect of leasing on an airline is also dependent on its business model and age as well as on its perception of uncertainty. According to Guzhva, Raghavan, and d'Agostino (2019), Low-Cost Carriers (LCCs), are significantly more sensitive to changes in the leasing ratio than legacy airlines or Full Cost Carriers (FCCs) due to their smaller fleet size and increased risk. Many LCCs have fewer types and amounts of aircraft in their fleets, making them much more sensitive to changes in their leasing ratio. For instance, EasyJet's fleet consists mostly of Airbus' A320 and A319 models (totaling 141 aircraft from its current fleet of 151), while Ryanair's current fleet is 100% composed of Boeing's new 737 models (737 NG and 737 MAX), a total of 252 aircraft (EasyJet, 2022; Ryanair, 2022).

Thereby, the trade-off between leasing cost and flexibility is different for airlines of different ages and experience. Bourjade, Huc, and Muller-Vibes (2017) demonstrates that leasing is less cost-effective for older, mature airlines because long-term debt is cheaper for them compared to leasing. This is because FCCs have traditionally developed relationships with manufacturers and financial institutions and can negotiate better deals with them. While older airlines can more easily adapt to changes in demand with their own diversified fleets, younger airlines typically rely on leasing to have flexibility in their fleets.

4. Leasing contracts: a tripod leveraging growth and flexibility in face uncertainties

A lease is a binding contract or agreement among 1) a lessee (client airline), 2) a lessor (leasing company or supplier airline), and frequently, 3) a long-term creditor (that is, a lender: either debt or equity financing companies).

Aviation industry leases typically include the following terms in their agreement: fixed monthly lease payments, the required maintenance and return of the aircraft, termination terms, and the lessee's option of purchasing the aircraft at a reduced price at the end of the lease period (Guzhva, Raghavan, & D'Agostino, 2019). As explained by Rohde (2021), airlines lease aircraft for a few main reasons:

- Operate aircraft without the financial burden of purchasing them.
- Provide a temporary increase in capacity.
- Gain exposure and to know functionality of a new aircraft in the fleet (before buying or leasing more).
- Expand their fleet in a short amount of time.

- Examine future scope of an aircraft in a particular airline's fleet.
- Reduce aircraft maintenance costs.

In typical situations, leasing allows airlines to reduce their debt, helps them retain liquidity, and gives them greater financial agility. The option of paying a small fraction of the value of the aircraft each month is a key part of many airlines' strategy. Thus, leasing is the only fleet financing approach that enables a dynamic fleet expansion without large capital outlays, a fact that many airlines have recently embraced to cope with the COVID crisis (Ciesluk, 2020), and that is steadily being strengthened in the face of uncertainties and volatility in the global markets.

As illustrated by the author, Wizz Air (a Hungarian low-cost airline) may not have achieved its impressive 253% increase in passenger numbers over the past eight years had the company not chosen to lease 100% of its fleet. Furthermore, the recent, dynamic growth of Vueling (Spain), LOT (Poland), IndiGo (India), or GOL (Brazil) was also fostered by aircraft leases. These carriers now have over 70% of their planes leased.

If leasing provides airlines with so many benefits, why would airlines still consider purchasing? As claimed by Ciesluk (2020), owning aircraft also has its benefits. For instance, if an aircraft is grounded, either due to a network planning problem, or because of a global pandemic, the airline is not required to continually pay for its lease because it owns it outright. Moreover, purchasing aircraft directly from manufacturers typically results in a lower total cost per aircraft obtained (due to discounts negotiated with the manufacturer).

At uncertain times such as the ongoing pandemic and the Russian/Ukrainian war, legacy airlines as Lufthansa, which owns 80% of its fleet, can encumber their aircraft, meaning they can secure loans using their aircraft as collateral. Such an option is vital given the current uncertain circumstances, yet many airlines do not have such a choice. The next subsections briefly present the main different types of lease contracts, their main characteristics, and how differently they can provide airlines with flexibility to face uncertainties.

4.1 Operating lease

As the name implies, operating leases allow the lessee to operate (fly) the aircraft, thus generating value (revenue) for its business model. According to the (Corporate Finance Institute, 2022), some of the advantages of operating leases are:

- Greater flexibility to companies as they can often replace/update their equipment.
- No risk of obsolescence, as there is no transfer of ownership.
- Accounting for an operating lease is simpler.
- Lease payments (rent) are operating expenditures (OPEX), thus tax-deductible.

- It provides improved Return on Asset (ROA) with no capital budgeting restraints.

Operating leases are categorized in four main groups, as shown in Table 2, and are detailed as follows.

Table 2. Operating leases typology summary

	Dry Lease	Moist Lease	Damp Lease	Wet Lease
Aircraft	YES	YES	YES	YES
Crew	NO	No crew	Limited crew	YES
Maintenance	NO	YES	YES	YES
Insurance	NO	YES	YES	YES
AOC	Lessee	Lessor	Lessor	Lessor
Lease duration	Long term	Short term <i>(seasonal)</i>	Short term <i>(seasonal)</i>	Short term <i>(seasonal)</i>
Main clients	LCCs/FCCs	LCCs & Private charter	LCCs & Private charter	LCCs & Private charter
Market share	40-60% global <i>(50% for new aircrafts)</i>	Less than 2.00% <i>(marginal market)</i>	Less than 2.00% <i>(marginal market)</i>	Less than 2.00% <i>(marginal market)</i>

Source: prepared by the authors.

Dry lease

Being the prevailing type of operating lease in aviation, dry lease is an arrangement whereby an aircraft financing entity (lessor), such as GECAS, Avolon, AerCap, provides an aircraft without crew, ground staff, maintenance, etc. It is typically a long-term agreement (averaging from 12 to 18 years) used by leasing companies, banks, and equity funds (acting as long-term creditors), requiring the lessee (client airline) to put the aircraft on its own Air Operator's Certificate (AOC), provide aircraft registration as well as crew, maintenance, and insurance for the aircraft (GPS, 2012), (Guzhva, Raghavan, & D'Agostino, 2019).

Wet lease (or ACMI)

Differently from most dry lease agreements, wet leases take place between two ICAO (International Civil Aviation Organization) members (GPS, 2012), meaning that a lessor company (such as: GECAS or Avolon) due to their finance capital nature, cannot engage in wet lease agreements. In here an airline (acting the lessor) not only provides the Aircraft (as in dry leases), but also provides the complete Crew, Maintenance, and Insurance (ACMI) to another airline (acting as the lessee), which pays by hours operated (pay-as-you-go). Wet leases are generally short-term contracts, lasting from 1 to 24 months, being typically applied during peak seasons, annual heavy maintenance checks, or to initiate new routes.

Damp and Moist leases

In these agreements, the lessor provides the aircraft to the lessee but without the cabin crew (in moist leases) or with limited cabin crew (in damp leases), the rest of the agreement

remains the same at large (Guzhva, Raghavan, & D'Agostino, 2019). This can only be done if the cabin crew receives SEP (Safety and Emergency Procedures) training by the lessor, to be acquainted with the differences of the aircraft. Nevertheless, the lessor will provide a supervising cabin purser. Damp and Moist leases in some countries are also known as wet lease without fuel (BalkanAir Aviation, 2021), (GPS, 2012).

4.2 Finance lease

Unlike operating leases, a finance lease (or capital lease) is a long-term lease that allows the lessee (client airline) to keep the aircraft on its balance sheet at the present value of the lease payments and to depreciate the asset as if it owned it (Guzhva, Raghavan, & D'Agostino, 2019). To be classified as a finance lease, the agreement must meet at least one of the following four requirements (in line with the U.S. Statement of Financial Accounting Standards No.13 of 1976¹):

- 1) The present value of lease payments must be 90% or more of the total asset value.
- 2) The lease agreement transfers ownership of the asset.
- 3) The lease agreement is 75% or more of the estimated economic life of the asset.
- 4) The lessee has the option to purchase the asset at a price below fair market value at the end of the lease (bargain purchase option).

By resembling a loan agreement, in a financing lease the lessor assumes all market value risks and benefits associated with the aircraft ownership, especially with respect to its value after the lease expire and allocate the “net” lease liabilities to the lessee under the contract terms (Rohde, 2021). According to the author, the essential promise the lessee makes is that, upon acceptance, it cannot cancel the lease and is obligated to pay the rents and other amounts listed under the agreement, commonly known as a “hell or high-water contract”². Thus, although it may reap benefits such as depreciation and interest expenses, once engaged in this type of agreement, the lessee must fulfill its contractual obligations even in times of crisis and uncertainty, which can be a potential risk to its business model. Finance leases are mainly categorized under leveraged leases, and sale and leaseback deals.

Leveraged lease

Given the level of cost associated with purchasing an aircraft, it is not unusual to have more than one long-term creditor participating in a lease transaction, thus a prevailing feature of leveraged finance leases is the involvement of three parties: a lessee, a lessor, and a long-term

¹ Available at: https://www.fasb.org/jsp/FASB/Document_C/DocumentPage?cid=1218220124481&acceptedDisclaimer=true

² A “hell or high-water contract” (also known as a promise-to-pay contract) is a non-cancelable contract which stipulates that the purchaser must make the specified payments to the seller, regardless of any difficulties they may encounter. Its clauses bind the purchaser or lessee to the terms of the contract until the contract's expiration.

creditor (lender). The long-term creditor act as the final party that finances (leverages) the remainder of the cost of the aircraft (Guzhva, Raghavan, & D'Agostino, 2019).

Sale and leaseback deals

Under a sale and leaseback agreements, an airline (owner of an aircraft), sell its aircraft to a third-party at an agreed-upon price (usually a lessor or a bank), and immediately undertake an agreement to lease it back on previously agreed-upon terms. The most common reason for such transactions is for airlines to free up capital and quickly obtain liquidity (Ciesluk, 2020), allowing these companies greater financial flexibility in managing their assets and operations. This type of transaction allows both parties to take advantage of the tax benefits. The lessor, as the current owner of the aircraft, can take advantage of tax reductions from depreciation and interest expense incurred. The lessee, on the other hand, who no longer owns the asset, can remove a substantial portion of the debt from its balance sheet while making the lease payments, which are treated as current expenses and therefore subject to tax deductions (Guzhva, Raghavan, & D'Agostino, 2019), thus increasing their commercial flexibility toward eventual market uncertainties.

In addition, as stated by the Guzhva, Raghavan and D'Agostino (2019), an airline seeking to complete a sale and leaseback transaction as the aircraft approaches delivery may have the opportunity to sell the same aircraft to a third party at a higher price than was anticipated in the original negotiations with the manufacturer. This gives the airline the opportunity to make a profit and put the capital back into the organization to fund operations.

5. Accounting and tax implications of leasing contracts

As put by Guzhava, Raghavan and D'Agostino (2019) once an asset is purchased, most countries Internal Revenue Service (IRS) allows deductible tax benefits to be applied on the asset's depreciation and the interest payments made on loan. In addition, such depreciation benefits may also be realized upon the asset's sale if the asset's market value is less than the depreciated book value. This accounting peculiarity is essential for understanding the exponential growth of the aircraft leasing industry. As aircraft owners, lessors get greater tax deductions for depreciation and interest expense and can pass these benefits to the airlines in terms of lower lease payments. This has made leasing attractive to airlines compared to purchasing.

Thereby, considering such growing relevance of the aircraft leasing market, it is essential to clearly understand the underlying accounting frameworks from the two main groups of

leasing contracts: finance and operating leases.

5.1 Finance leases accounting

According to (Diffen, 2022), finance leases are analogous to financing a car with a loan: the car buyer is the owner for all practical purposes, but legally the financing company retains title until the loan is repaid. When the lease agreement is signed, a “lease receivable” – equal to the present value of the lease payments – is created as a liability in the lessor’s balance sheet. As the lessor receives the lease payments, the principal payment portion reduces the lease receivable on the balance sheet. Thus, it does not add to the current period income. Meanwhile, the “right of use” based on its Net Present Value (NPV) is included on the lessee’s balance sheet as a long-term asset. In contrast, the “loan” amount –the NPV of all future payments – is included under liabilities.

Depreciation and interest expenses are reported in the lessee’s income statement. For the cash flow, the lessee must record the recurrent lease payments to the lessor (composed of the interest expense plus the principal repayment). Such peculiarities mean that a finance lease resembles a loan with a Loan-to-Value (LTV) of 100%, thus: the principal is defined as a debt in the lessee’s cash flow, the aircraft as a long-term asset in the balance sheet (Chen, Huang, & Ardiansyah, 2018). The lessor on the other hand, will register such lease payments as inflows on its cash flow (interest income plus principal reduction), while at the same time writing it on its income statement the interest income, and on its balance sheet both principal reduction and interest income. Figure 2 summarizes the finance lease framework for both lessor and lessee.

Lessor				Lessee			
Balance sheet				Balance sheet			
Assets		Liabilities & Equity		Assets		Liabilities & Equity	
Long-term lease receivable		Principal reduction Interest Income		Aircraft <i>(depreciated as payments are made)</i>		Lease liability <i>(amortized as payments are made)</i>	
Income Statement		Cash Flow		Income Statement		Cash Flow	
Incomes	Expenses	Inflows	Outflows	Incomes	Expenses	Inflows	Outflows
Interest income	-	Lease payment <i>(interest + principal reduction)</i>	Aircraft purchase	-	Amortization Interests	-	Lease payment <i>Cash paid for principal (financing) + interest payments (operating)</i>

Figure 2. Finance lease accounting framework (simplified)
 Source: Prepared by the authors

During the COVID-19 pandemic, aircraft finance leases have been an interesting growing phenomenon. With the sharp decline in demand, airlines have experienced unprecedented liquidity challenges. With that, many of those who own their aircraft fleet (or at least part of

it) started engaging in sale-and-leaseback deals based on their unencumbered aircraft to raise additional capital and help them get through the downturns caused by the pandemic (Watts, 2020). Some notable examples cited by the author are:

- In April 2020, Delta Air Lines entered a SLB transaction that released US\$1 billion in cash. The airline entered two separate SLB agreements with BBAM Aircraft Leasing & Management and Altavair AirFinance, raising US\$750 million and US\$250 million, respectively.
- EasyJet reported that it unlocked US\$266 million in cash through an agreement with Bocomm Leasing in August 2020. In total, easyJet has so far raised US\$804 million through SLB transactions, mainly through its fleet of A320 family aircraft.
- Cathay Pacific raised approximately US\$704 million in a sale and leaseback transaction with BOC Aviation, involving six Boeing 777-300ER aircraft, at the onset of the pandemic.

5.2. Operating leases accounting

Up until recently operating lease contracts did need to consider ownership transfer from the lessor to the lessee for accounting purposes. However, a joint project between the Financial Accounting Standards Board (FASB) in the U.S., and the International Accounting Standards Board (IASB) issued the respective new lease accounting standards ASC 842 (valid in the United States) and the IFRS 16 (international), which modifies and replaces the current financial accounting and reporting of leasing contracts (mainly for the lessee's standpoint).

Effective January 1, 2019, for many companies, the IASB's and the FASB's new leases standards require nearly all leases to be reported on lessees' balance sheets as assets and liabilities (Bogle, 2017). Previously, only finance leases were required to be recognized on lessee balance sheets, however, as put by (Mayer, 2021), these new rules require that all operating leases with a term over one year (12 months) and with asset values over 5.000,00 USD need to be shown in the lessee's balance sheet as both an asset and as a liability, reflecting the obligation to make future lease payments. However, as (Mayer, 2021) explained, the amount to be recorded will be the present value of the future lease payments, not the asset's current market value.

As explained by Deloitte (2020) this new approach to operating lease accounting provides investors and other stakeholders with a more transparent and complete view of the lessee's financial picture. Under the older standards (ASC 840 and IAS 17), the accounting presentation of operating leases did not provide proper visibility regarding the liability for future lease payments, thus under the new ones, such future payments are required to be recognized on the balance sheet (Shemaria, 2020).

Under ASC 842, the income statement shows a straight-line expense of the cash payment to

the lessor within operational costs; the same goes for the cash flow. Furthermore, the lessee's income statement shows no interest expense or depreciation. As for the lessor, when the lease payment is received, it is recorded as lease income on its cash flow and the income statement. Furthermore, by owning the asset, besides keeping it on its balance sheet, the lessor must recognize its depreciation expenses on its income statement over the asset's useful economic life. Figure 3 provides a simplified view of the operating lease accounting framework for both lessor and lessee under the new standards.

Lessor				Lessee			
Balance sheet				Balance sheet			
Assets Aircraft		Liabilities & Equity Lease liability		Assets Aircraft's "right of use" Present value of the lease payments		Liabilities & Equity Lease liability Present value of the lease payments	
Income Statement		Cash Flow		Income Statement		Cash Flow	
Incomes Lease income	Expenses Depreciation	Inflows Lease payments	Outflows Aircraft purchase	Incomes -	Expenses Lease expense (on a straight-line basis)	Inflows -	Outflows Lease payments

Figure 3. Operating lease accounting framework under IFRS 16 and ASC 842 (simplified)
 Source: Prepared by the authors.

6. Stakeholders' roles to cope with market uncertainties

To provide a panorama on this complex business model, and how it can help airlines to finance their assets to cope with market uncertainties, this section describes the role of the eleven main stakeholders involved in the aircraft leasing ecosystem. Figure 4, visually describes such ecosystem, and following it, details are provided the overall functioning of this market, the main types of contracts among the involved actors, and the main flows of value.

The starting point of this analysis is the interactions between the aircraft manufacturer (OEM), and the lessor. The transaction here is basically guided by a purchasing agreement with the leasing company (lessor) negotiating the number of new aircraft to be bought from the OEM, as well as their prices and discount rates.

The higher the number of new aircraft negotiated, the better the discount rates the lessor will be able to get with the OEM (sometimes being up to 40% of the assets original sales price), and therefore more attractive lease rates can be offered to their lessees. In fact, such bargaining leverage with OEMs in terms of discount prices is part of the robustness of lessors' business model. As described by Donat et al. (2021), in 2020 during the first quarter of the pandemic, revenues were down only 5% year-over-year for lessors while falling 60% for airlines; and even as the pandemic progressed to the third-quarter of 2020, revenues still went down for lessors (36%) but not as sharply as they did for airlines (67%).

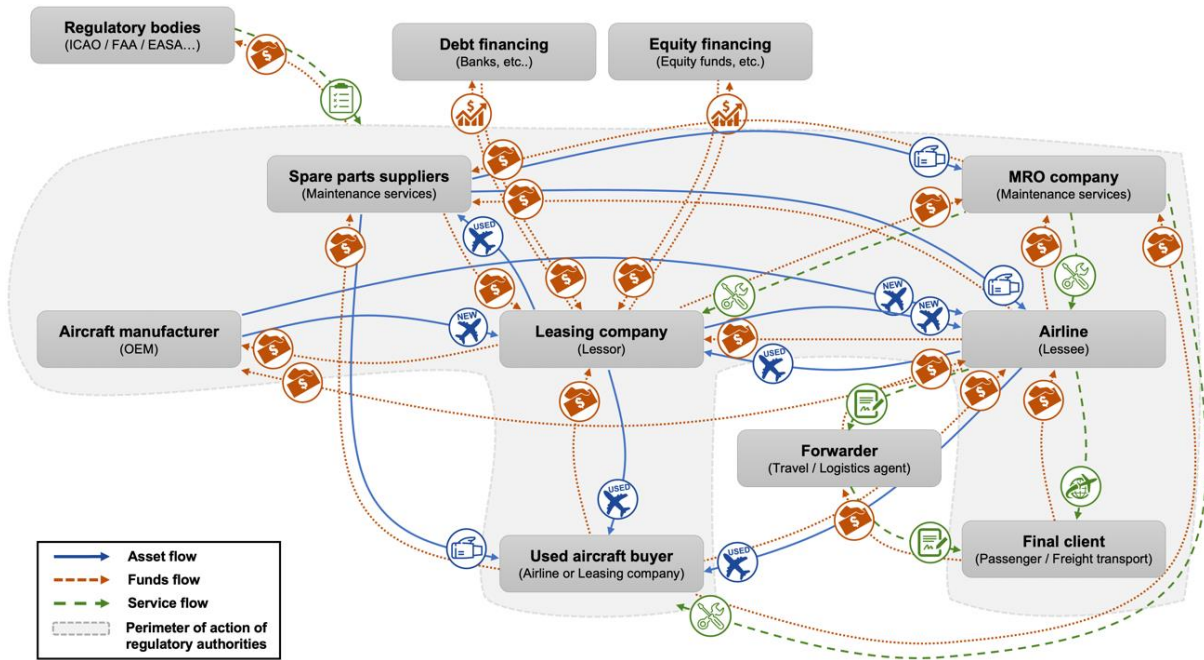


Figure 4. Aircraft leasing business ecosystem

Source: prepared by the authors

Once in possession of the aircraft, the next set of interactions are focused on the role of the leasing company (lessor), which can engage in different types of leasing contracts with the lessee (client airline), that is: finance leases as well as the several different types of operating leases (wet, dry, damp, moist). As a matter of fact, lessors act as an “uncertainty” buffer between aircraft OEMs and airlines, which according to Donat et al. (2021), has helped them withstand some of the initial shock of the pandemic.

At the end of a leasing contract, the lessee shall return the aircraft to the lessor, where the latter has a few options: a) engage in another lease contract with a new or same lessee; b) sell the used aircraft for another lessor or airline company, or 3) dismantle the aircraft and sell its spare parts to interested stakeholders (parts suppliers, airlines, MRO companies, etc.). The choice to be made will vary according to the age of the aircraft, the condition of the aircraft upon return from the lessee, as well as on the maintenance reserve allocated to the lessor. In this regard, one other important stakeholder group that has connections with the lessor is the used aircraft buyer, which may purchase the lessor’s used aircraft based on its residual market value and repurpose it for different uses (e.g.: retrofit it for cargo transport; or for commercial aviation in other markets).

The next important set of interactions regarding the lessor is with its funding counterparties. As stated by Guzhva, Raghavan, and d’Agostino (2019), airlines and leasing companies can raise capital to finance the acquisition of aircraft through: retained earnings; commercial

banks; debt markets; equity markets; manufacturer financing, and others. In fact, new and complicated instruments to finance aircraft are developed every year by institutional investors and fintech, and the innovation does not show signs of slowing down. As detailed on Figure 4, the most common forms of funding used in the industry are debt and equity financing mainly via trust contracts between the lessor and its funding counterparty.

As proven by the ongoing pandemic, the role of such funding institutions is an integral part of the aircraft leasing resilience in face of uncertainties. As stated by the KPMG “Aircraft leasing: proven resilience” report (KPMG, 2022), aircraft lessors entered the COVID-19 crisis in a much stronger position than in previous economic downturns. For instance, during the first Gulf War there were ten major lessors, and nine of them were wiped out. This time around, lessors are much more resilient and robust, with the top 15 lessors all backed by institutional funds.

Moving the analysis forward, for the industry to operate smoothly and safely, aircraft maintenance is crucial. In here, two stakeholders play a fundamental role: the spare parts supplier, and the Maintenance, Repair and Overhaul (MRO) company. As depicted on Figure 4, the spare parts suppliers have a strong and direct connection with the MRO company providing the tools and parts needed for the maintenance services.

However, it is not unusual that other stakeholders (such as airlines and used airline buyers) to make direct purchases of parts from suppliers if they have in-house maintenance shops. Lessors, on the other hand (due to the prevailing financing nature of their operations) don't usually buy spare parts directly from suppliers (especially if they don't hold any AOC). Whenever maintenance is needed for their returned airplanes, it is either provided by the lessee airline itself or by a third-part MRO company. Nonetheless, at the end of a lease agreement and depending on the state of the return aircraft, a lessor may choose to it to a spare parts supplier, who in turn, will dismantle it for parts sales.

As for the MRO connections with lessors, although existent, they are scarce; this is again due to the main financing nature of such companies. The few cases of direct contracts between a lessor and a MRO are for wet, damp and moist lease contracts (for which the lessor most hold an AOC), or for those extreme cases where the lessor needs to provide maintenance to the aircraft at the end of a dry lease by using its maintenance reserve – in these cases, the lessor may demand the lessee to hire an MRO himself and thus discount the amount from the paid maintenance reserve.

Moving to different level of analysis, it is important to understand the connections between the lessee (client airline) with its customers (that is passengers or cargo that need to be

moved). As shown on Figure 4, the most straightforward connection is a direct sale between the airline itself and the final client (ex.: a passenger travelling from A to B). Still prevalent in commercial passenger aviation, “direct sales correspond to about 60% of all total tickets sales” according to Niky Terzakis (CEO of Air Belgium). However, the role of forwarders (either for passengers – travel agencies, or cargo – freight forwarders) must not be neglected. These intermediary companies have been recently gaining ground for allowing an easier and a tailored-made customer experience to the final client, saving him/her the hurdle of engaging in all logistics planning for the trip or for cargo dispatch.

At last, it is worth emphasizing the role of the regulating bodies in this ecosystem (shaded in grey on Figure 4). Entities such as the International Civil Aviation Organization (ICAO), the European Union Aviation Safety Agency (EASA), as well as the U.S. Federal Aviation Administration (FAA) make sure that aircraft are suitable and ready to fly (airworthy), and that the involved stakeholders are complying with the certificates and legislation in place (national or international ones) as well as up to date with all fees and taxes.

7. Concluding remarks

By providing a detailed analysis of the aircraft leasing business model, the main forms of leasing contracts, the main stakeholders involved in it, as well as the respective value flows among them, this study sought to show the resilience of these contracts for airline fleet management in the face of market uncertainties.

Among the array of leasing contracts, operating dry leases are the prevailing form of contracts in the industry. Capital (finance) leases are also a common practice, being mainly used by airlines to obtain new aircraft even when they are running short in capital or while facing market uncertainties. In fact, capital leases such sale-and-lease-back-agreements, have been more popular than even during the ongoing pandemic (Yeomans, 2020; Watts, 2020). It is also worth noting that finance leases are a larger umbrella that may (or not) encompass operating leases, meaning: an aircraft under a certain dry-lease agreement, may for instance be also under a sale-and-lease back deal.

One of the most important factors weighing on airlines profitability is their aircraft fleet. Thus, ensuring positive margins and a stable and well-functioning fleet are major challenges. In fact, over the past 25 years, even before the COVID-19 pandemic, the airline industry has hovered around a 4-5% operating margin (IATA, 2020), thereby, economic uncertainty has always been lurking the sector.

As a result of their low profitability, most airlines are unable to fully use the tax benefit of

depreciation and interest tax deduction from owning their fleet, which in turn, makes leasing attractive when compared to purchase, because in addition to the flexibility, it provides for asset management. For the lessors, such business model is also proven effect, since as the owner of the asset; they get a bigger tax deduction from depreciation and interest expenses and can pass on that benefit to airlines in terms of lower lease payments.

As shown by the results of this study, aircraft leasing although being more expensive than purchasing, is still an attractive business model to most airlines, especially in contexts of market uncertainty. As stated by Aengus Kelly, CEO of AerCap, “the pandemic has shown that the leasing business is a good business (...) times of great stress, have proven the resilience of the aircraft leasing business, which is why we are seeing so much capital interested in the sector at the moment”. As a matter of fact, as evidence of this resilience, by 2021 lessors took 60% of all Boeing and Airbus aircraft orders combined, all placed under some form of lease, whether by sale-and-leaseback, order book, or finance lease. (KPMG, 2022).

The aircraft leasing market has grown significantly over the past several decades, but the pandemic has accelerated the growth of the leased fleet. Airlines have embarked on sale-leaseback transactions to monetize unencumbered assets in a hectic effort to secure liquidity in 2020 and the first half of 2021. With airline balance sheets expected to remain under stress for a year or two, and airlines under pressure to operate more fuel-efficient fleets, leasing is expected to continue to gain market share as it provides the flexibility and capital needed in an uncertain market. Furthermore, the current COVID crisis proves that the global aircraft leasing ecosystem is quite flexible since it was able to bend without noticeable breaking.

For research limitations, we point out the difficult on collecting primary data (ex: interviews with industry experts). Although countless emails and contact efforts have been made with Airlines, MROs, lessors, and so on, the response rate was minimum, which yielded in only a few interviews. Thus, most data and findings were based on secondary sources. At last, for future studies, a total cost of ownership analysis for the leasing contracts could be carried out, as well as a better understanding of the financing system and science behind them.

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